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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,995	01/31/2002	Steven Teig	SPLX.P0105	2855

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STATTLER JOHANSEN & ADELI
P O BOX 51860
PALO ALTO, CA 94303

EXAMINER

ROSSOSHEK, YELENA

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/062,995	Applicant(s) TEIG ET AL.	
	Examiner Helen B Rossoshek	Art Unit 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01/26/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the application 10/062,995 filed 01/31/2002 and amendment filed 12/09/2003.

2. Claims 1-12 remain pending in the application. Claims 10-12 have been added to the application.

3. Examiner fully considered applicant's amendment and submits new ground of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Igarashi et al. (US Patent 6,546,540).

With respect to claims 1-3 Igarashi et al. teaches an integrated circuit layout comprising a first set of vias that have a diamond shape and a second set of vias that have a rectangular shape as shown on the Fig. 3 wherein square (diamond) shape of the connection pattern (via) (15A) in the layout of the integrated circuit is depicted (col. 8, ll.54-56), the connection pattern may have also rectangular shape (abstract; col. 9, ll.5-8); a first via in the first set traverses two layers of the IC layout and the first via has

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a contact on each of the layers, wherein each contact is in the shape of diamond as shown on the Fig. 9A wherein first interconnect line (33) is in one layer and second interconnect line (31) is in the other layer of the integrated circuit layout (col. 4, ll.32-46) and plurality of connection patterns via (35) are used to interconnect two square regions of the two interconnect lines from two different layers of the integrated circuit layout (col. 11, ll.66-67; col. 123, ll.1-5); a second via in the second set traverses two layers of the IC layout and the second via has a contact on each of the layers, wherein each contact of the second via is in the shape of a rectangle as shown on the as shown on the Fig. 9A wherein the pattern contact may have rectangular shape instead of square (col. 9, ll.5-8).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. in view of Rostoker et al. (US Patent 5,822,214)

8. With respect to claims 4-8 and 10-12 Igarashi et al. teaches a first set of vias, wherein each via in the first set traverses at least two layers and has one contact on each of the layers, wherein one of the contacts is in the shape of a rectangle and one of the contacts is in the shape of diamond as shown on the Fig. 8 wherein connection pattern 25B is a part of the end of the portion of the one interconnect line defined on

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one layer and has a shape of parallelogram (rectangular) and 27 is a square (diamond) part of the end of the interconnect line on the other layer (col. 11, ll.26-33); the rectangle is a square as shown on the Fig. 4A (col. 9, ll.5-10); the rectangular has a different length and width as shown on the Fig. 10A the end of the interconnect line (43) has a rectangular end, wherein the length and the width are not equal since it is not a square; the diamond has four equal sides as shown on the Fig. 4A; the diamond has two pairs of sides, wherein the length of one pair of sides is different than the length of the other pair sides as shown on the Fig. 4A and 4B wherein both ends of interconnect lines have square shapes but different size of the side of each square (one inside of an other), but lacks the specifics regarding the different shapes of polygon such as hexagon, octagon and having half of the polygon shape in the interconnect line ends. However Rostoker et al. teaches a first set of interconnect lines terminating on at least a plurality of the first set of vias, wherein the interconnect lines in the first set of interconnect lines have ends that terminate on the contacts, wherein a plurality of the interconnect line ends are in shape of a half polygon, wherein the polygon has more than four sides as shown on the Fig. 131 wherein three wires (852, 852, 853) which are interconnect lines from different layers and establishes the electrical connection between them within a via (850) in a shape of hexagonal (polygon with more than four sides) and as shown on the Fig. 111 wherein the via (414) is bended and interconnect lines have ends that can be terminated in the contacts and make only half of the shape of the end of interconnect line which can be as half of the hexagonal shape as shown on the Fig. 131 (col. 57, ll.13-17; col. 86, ll.22-38); the interconnect line ends are on the

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shape of a half-octagon, half hexagon and as shown on the Fig. 111 wherein the via (414) is bended and interconnect lines have ends that can be terminated in the contacts and make only half of the shape of the end of interconnect line which can be as half of the hexagonal shape as shown on the Fig. 131 (col. 57, ll.13-17; col. 86, ll.49-58); the interconnect lines with half polygon ends terminate on the diamond shaped contacts as shown on the Fig. 111 wherein vias (419) is bended in half, and rectangular shaped vias can terminate the contacts ends as square (diamond) (col. 20, ll.49-54). It would have been obvious to one of ordinary skill on the art at the time the invention was made to have combined both teachings, because ~~it~~ various configurations of via shapes, including shapes having more obtuse angles and more than four sides will guarantee cross-sectional area of wiring cut to be suitable.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi in view of Blatchford et al. (US Patent 6,680,150).

With respect to claim 9 Igarashi et al. teaches an integrated circuit layout comprising a first set of vias, wherein each via in the first set traverses at least two layers and has one contact on each of the layers, wherein one of the contacts is in the shape of a quadrilateral polygon as shown on the Fig. 9A wherein first interconnect line (33) is in one layer and second interconnect line (31) is in the other layer of the integrated circuit layout (col. 4, ll.32-46) and plurality of connection patterns via (35) are used to interconnect two square regions of the two interconnect lines from two different layers of the integrated circuit layout (col. 11, ll.66-67; col. 123, ll.1-5) and the connection pattern may have also rectangular and other shapes having four sides

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polygon (quadrilateral) (abstract; col. 9, ll.5-8), but lacks the specifics regarding the contacts in the shape of non-quadrilateral polygon. However Blatchford et al. teaches set of vias, wherein each via traverses at least two layers and has one contact on each of the layers, wherein one of the contacts is in the shape of non-quadrilateral polygon as shown on the Fig. 1, 3 and 5 wherein different shapes (non-rectangular) of contact structures for the semiconductor substrates (col. 2, ll.30-35). It would have been obvious to one of ordinary skill on the art at the time the invention was made to have combined both teachings in order to provide various configurations of contacts to thereby guarantee cross-sectional area of wiring cut to be suitable, which will provide an attenuated phase-shift photomask having multiple non-rectangular contact structures, in which the contact structures are formed of a transmissive material (~~col. 2, ll.33-36~~).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen B Rossoshek whose telephone number is 571-272-1905. The examiner can normally be reached on 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HR


VUTHE SIEK
PRIMARY EXAMINER